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10/757,477	01/15/2004	Young Dae Kim	YHK-0131	4151

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EXAMINER

BODDIE, WILLIAM

ART UNIT	PAPER NUMBER
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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/757,477		KIM, YOUNG DAE	
	Examiner		Art Unit	
	William L. Boddie		2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. In an amendment dated, February 1st, 2007, the Applicant amended claims 1, 5-10, 12, 14-16, 18-19 and added new claims 21-25. Currently claims 1-25 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-25 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 15 recites the limitation "said low brightness weighting value" in line 17.

There is insufficient antecedent basis for this limitation in the claim.

Applicant appears to be referencing an earlier description of a "low weighting value" on line 13.

5. Claim 25 recites the limitation "said first slope" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

It appears as though the Applicant intended claim 25 to be dependent upon claim 24. Claim 25 will be examined based on this assumption in the current Office action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

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said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 5-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakita et al. (US 6,545,423) in view of Applicant's Admitted Prior Art (hereinafter, APA).

With respect to claim 1, Sakita discloses, a method of driving a plasma display panel, comprising:

applying a first waveform (TR2 in fig. 31, for example) to a sustain electrode (row electrode X in fig. 13) during a first time interval (preparation period TR; col. 14, lines 63-65) included in an initial sub-field (SF4 in fig. 31) of one frame (Tsf in fig. 31); and

applying a second waveform (TR1 in fig. 31; for example) to a sustain electrode during a second timer interval (preparation period TR) of all or fewer than all of the of the remaining sub-fields (SF1,2,3,p all have TR1) following the initial sub-field, wherein the first waveform is different from the second waveform (col. 18, lines 6-16).

Sakita does not expressly disclose, applying rising and falling pulses to a scan electrode, nor does Sakita disclose set-up and set-down intervals.

APA discloses, applying a rising pulse to a scan electrode during a set-up interval of an initialization period, wherein the rising pulse changes to a second voltage after the rising pulse has changed to a first voltage, wherein the second voltage is higher than the first voltage (Y electrode waveform in fig. 5);

applying a falling pulse to a scan electrode during a set-down interval of the initialization period, wherein the falling pulse changes to a fourth voltage after the falling

pulse has changed to a third voltage, wherein the third voltage is higher than the fourth voltage (Z electrode in fig. 5).

APA further discloses, applying a first waveform to a sustain electrode during a first time interval that is a portion of the set-up interval (T_d in fig. 5); and

applying a second waveform to a sustain electrode during a second time interval that is a portion of the set-up interval (Z electrode pulse in fig. 3).

Sakita and APA are analogous art because they are both from the same field of endeavor namely, driving waveforms for plasma display devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to supply the scan electrode pulses taught by APA to the panel of Sakita. Furthermore it would have also been obvious to one of ordinary skill to apply waveforms during to a sustain electrode during a portion of a set-up interval.

The motivation for doing so would have been increased contrast and less chance of brightness misfires (APA; page 6, lines 8-10).

To further explain the combination, Sakita discloses, applying one type of initialization waveform to one subfield (SF4 in fig. 31) of a frame and a separate distinct initialization waveform to the rest of the subfields (SF1 etc. in fig. 31) of the frame. The Applicant is also pointed to the fact that the addressing waveforms are identical from one subfield to the next, likewise the sustain waveforms are only altered from one subfield to the next due to the differences in luminance of the subfield. Finally and most telling, Sakita discloses, that the initialization waveform of each subfield is dependent upon the weight (or brightness) of luminance of the subfield (col. 14, lines 63-67).

By Applicant's admission the waveforms of figures 3 and 5 have been known in the art prior to the Applicant's invention. Also known is that the initialization waveform of figure 5 provides for increased contrast, but is hampered by the fact that misfires occur in high brightness subfields. Finally it is also disclosed by the Applicant that it was previously known in the art that the initialization waveforms of figure 3 are not susceptible to brightness misfires in high brightness subfields, but lack the improved contrast quality of the figure 5 waveforms.

Thus it seems clear to the Examiner that it would have been obvious to one of ordinary skill in the art to combine the two teachings to create a plasma display device having improved contrast, as well as, protection against misfires in high brightness subfields.

With respect to claim 5, Sakita and APA disclose, the method as claimed in claim 1 (see above).

APA further discloses, the set-up interval is for forming wall charges within cells by a writing discharge, and the set-down interval is for erasing a portion of said wall charges by an erasure discharge (clear from fig. 5), wherein the sustain electrode is electrically floated during a first time interval that is a portion of the set-up interval(also see page 6, line 4 – page 8, line 11 of the current specification).

With respect to claim 6, Sakita and APA disclose, the method as claimed in claim 5 (see above).

APA further discloses, wherein each initialization period (fig. 3) of the remaining sub-fields other than the initial sub-field include a set-up interval for forming wall

charges within cells by a writing discharge, and a set-down interval for erasing a portion of said wall charges by an erasure discharge, and wherein the sustain electrode is supplied with a ground voltage during the set-up interval (also see page 4, lines 1-21 of the current specification).

With respect to claim 7, Sakita and APA disclose, the method as claimed in claim 5 (see above).

APA further discloses, wherein each initialization period of the remaining sub-fields other than the initial sub-field includes a set-up interval for forming wall charges within cells by a writing discharge, and a set-down interval for erasing a portion of said wall charges by an erasure discharge, and wherein the sustain electrode is are electrically floated during a shorter time than said first time interval in the set-up interval (seems clear from a comparison between fig. 3 and fig. 5, that the sustain is floated for a shorter time in the fig. 3, sub-field.).

With respect to claim 8, Sakita and APA disclose, the method as claimed in claim 7 (see above).

As discussed above the pairing of the teachings of Sakita with that of APA sufficiently disclose an initialization period. In subfield SF4 an initialization period TR1 is supplied to the sustain electrodes. In the succeeding sub-frames (the higher brightness sub-frames) a second waveform (TR1) is applied to the sustaining electrodes.

The replacement of the reset period of this second waveform with the initialization period of the APA's figure 3, clearly ensures that a time interval when the

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sustain electrode is floated is set to be shorter as it goes into the last sub-field of a frame. In the case of figure 3, the time interval becomes zero.

With respect to claim 9, Sakita and APA disclose, the method as claimed in claim 5 (see above).

APA further discloses, wherein a voltage rising at a first slope is applied to the sustain electrode during said first time interval (clear from fig. 5).

With respect to claim 10, Sakita and APA disclose, the method as claimed in claim 9 (see above).

APA further discloses, wherein each initialization period of the remaining sub-fields other than the initial sub-field includes a set-up interval for forming wall charges within cells by a writing discharge, and a set-down interval for erasing a portion of said wall charges by an erasure discharge, and wherein a voltage rising at a lower slope than said first slope is applied to the sustain electrode during said first time interval that is a portion of the set-up interval (clear from fig. 3).

With respect to claim 11, Sakita and APA disclose, the method as claimed in claim 10 (see above).

The combination of APA and Sakita disclose, wherein said voltage applied to the sustain electrode is set to have a lower slope (0 slope in APA; fig. 3) as it goes into the last sub-field of said frame (TR1 in SFp in fig. 31). For further discussion see the above rejection of claims 1 and 8.

With respect to claim 12, Sakita discloses, a method of driving a plasma display panel, comprising:

applying a first waveform (TR2 in fig. 33, for example) to a sustain electrode (row electrode X in fig. 13) during a first time interval (preparation period TR; col. 14, lines 63-65) included in an initial sub-field (SF2,3 in fig. 33) having a low weighting value at one frame (Tsf in fig. 31); and

applying a second waveform (TR1 in fig. 31; for example) to a sustain electrode during a second time interval (preparation period TR) of all or fewer than all of the of the remaining sub-fields (SF1,2,3,p all have TR1) other than the initial sub-field having said low brightness weighting value, wherein the first waveform is different from the second waveform (col. 18, lines 6-16).

Sakita does not expressly disclose, applying rising and falling pulses to a scan electrode, nor does Sakita disclose set-up and set-down intervals.

APA discloses, applying a rising pulse to a scan electrode during a set-up interval of an initialization period, wherein the rising pulse changes to a second voltage after the rising pulse has changed to a first voltage, wherein the second voltage is higher than the first voltage (Y electrode waveform in fig. 5);

applying a falling pulse to a scan electrode during a set-down interval of the initialization period, wherein the falling pulse changes to a fourth voltage after the falling pulse has changed to a third voltage, wherein the third voltage is higher than the fourth voltage (Z electrode in fig. 5).

APA further discloses, applying a first waveform to a sustain electrode during a first time interval that is a portion of the set-up interval (Td in fig. 5); and

applying a second waveform to a sustain electrode during a second time interval that is a portion of the set-up interval (Z electrode pulse in fig. 3).

Sakita and APA are analogous art because they are both from the same field of endeavor namely, driving waveforms for plasma display devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to supply the scan electrode pulses taught by APA to the panel of Sakita. Furthermore it would have also been obvious to one of ordinary skill to apply waveforms during to a sustain electrode during a portion of a set-up interval.

The motivation for doing so would have been increased contrast and less chance of brightness misfires (APA; page 6, lines 8-10).

Please note the above discussion in claim 1, further clarifying the combination.

With respect to claim 13, Sakita and APA disclose, the method as claimed in claim 12 (see above).

Sakita further disclose, wherein said sub-field having said low brightness weighting value includes at least one sub-field having a brightness weighting value that is less than a half of the maximum brightness weighting value of said frame (seems clear from simply judging the lengths of the sustain periods that SF2 is less than half of SFp in fig. 33).

With respect to claims 14-20, as these claims are sufficiently similar to the limitations of claims 5-11, claims 14-20 are rejected on the same merits shown above in claims 5-11.

With respect to claim 21, Sakita discloses, a method of driving a plasma display panel, comprising:

applying a first waveform (TR2 in fig. 33, for example) to one or more sustain electrodes (row electrode X in fig. 13) in an initialization period (preparation period TR; col. 14, lines 63-65) included in an initial sub-field (SF4 in fig. 31) of one frame (Tsf in fig. 31); and

applying a second waveform (TR1 in fig. 31; for example) to the one or more sustain electrodes in an initialization period (preparation period TR) of all or fewer than all of the remaining sub-fields (SF1,2,3,p in fig. 31 all have TR1) following the initial sub-field of said frame; wherein the second waveform is different from the first waveform (col. 18, lines 6-16).

Sakita does not expressly disclose a set-up or a set-down interval or that the waveforms are applied during such an interval. Furthermore Sakita does not expressly disclose electrically floating a sustain electrode during the first waveform.

APA discloses, a method of driving a plasma display panel, comprising:

a first and second waveform (figs. 5 and 3) which contain an initialization period which includes a set-up interval for forming wall charges within at least one cell by a writing discharge, and a set-down interval for erasing a portion of said wall charges by an erasure discharge (see page 4, lines 1-21 of the current specification); wherein one or more sustain electrodes are electrically floated during a first time interval that is a portion of the set-up interval and wherein the second waveform is different from the first

waveform and is applied during a second time interval that is a portion of said set-up interval (also see page 6, line 4 – page 8, line 11 of the current specification).

Sakita and APA are analogous art because they are both from the same field of endeavor namely, driving waveforms for plasma display devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to supply the scan electrode pulses taught by APA to the panel of Sakita. Furthermore it would have also been obvious to one of ordinary skill to apply waveforms during to a sustain electrode during a portion of a set-up interval.

The motivation for doing so would have been increased contrast and less chance of brightness misfires (APA; page 6, lines 8-10).

To further explain the combination, Sakita discloses, applying one type of initialization waveform to one subfield (SF4 in fig. 31) of a frame and a separate distinct initialization waveform to the rest of the subfields (SF1 etc. in fig. 31) of the frame. The Applicant is also pointed to the fact that the addressing waveforms are identical from one subfield to the next, likewise the sustain waveforms are only altered from one subfield to the next due to the differences in luminance of the subfield. Finally and most telling, Sakita discloses, that the initialization waveform of each subfield is dependent upon the weight (or brightness) of luminance of the subfield (col. 14, lines 63-67).

By Applicant's admission the waveforms of figures 3 and 5 have been known in the art prior to the Applicant's invention. Also known is that the initialization waveform of figure 5 provides for increased contrast, but is hampered by the fact that misfires occur in high brightness subfields. Finally it is also disclosed by the Applicant that it

was previously known in the art that the initialization waveforms of figure 3 are not susceptible to brightness misfires in high brightness subfields, but lack the improved contrast quality of the figure 5 waveforms.

Thus it seems clear to the Examiner that it would have been obvious to one of ordinary skill in the art to combine the two teachings to create a plasma display device having improved contrast, as well as, protection against misfires in high brightness subfields.

With respect to claim 22, Sakita and APA disclose, the method of claim 21 (see above).

APA further discloses, wherein the second waveform (fig. 3) supplies the one or more sustain electrodes with a ground voltage during the set-up interval of all or fewer than all of the remaining sub-fields (also see page 4, lines 1-21 of the current specification).

With respect to claim 23, Sakita and APA disclose, the method of claim 21 (see above).

APA further discloses, wherein the second waveform allows the one or more sustain electrodes to be electrically floated during a shorter time than the one or more sustain electrodes that are allowed to be electrically floated when the first waveform is applied during said first time interval in the set-up interval of the initial subfield (seems clear to the Examiner that the fig. 3 waveform is floated for a shorter time (in this case, not at all) than the fig. 5 waveform that is floated for a defined period of time).

With respect to claim 24, Sakita and APA disclose, the method of claim 21 (see above).

APA further discloses, wherein the first waveform (fig. 5) allows the one or more sustain electrodes to have a voltage rising at a first slope during said first time interval in the set-up interval of the initial sub-field (clear from fig. 5).

With respect to claim 25, Sakita and APA disclose, the method of claim 21 (see above).

APA further discloses, wherein the second waveform (fig. 3) allows the one or more sustain electrodes to have a voltage rising at a second slope different than said first slope during said first time interval in the set-up interval of all or fewer than all of the remaining sub-fields (clear from fig. 3 that the slope of the waveform in the second waveform is 0, which is different than the non-zero slope shown in fig. 5).

8. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakita et al. (US 6,545,423) in view of Applicant's Admitted Prior Art (hereinafter, APA) and further in view of Matsumoto et al. (US 5,854,540).

With respect to claim 2, Sakita and APA disclose, the method as claimed in claim 1 (see above).

Neither Sakita nor APA expressly disclose, wherein said initial sub-field is at least one sub-field including the first sub-field of said frame.

Matsumoto discloses, wherein said initial sub-field is at least one sub-field including the first sub-field of said frame (first sub-frame is the LSB sub-frame (clear in fig. 13; aka 5th embodiment), as discussed in the 6th embodiment).

Sakita, APA and Matsumoto are analogous art because they are all from the same field of endeavor namely sustain electrode waveforms for plasma display devices.

At the time of the invention it would have been obvious to order and apply the different initialization waveforms of Sakita and APA to the subfields as taught by Matsumoto.

The motivation for doing so would have been decrease the number of priming pulses and enhancing the contrast without appreciable degradation in the quality of the image (Masumoto; col. 25, lines 45-47, 57-58).

With respect to claim 3, Sakita, APA and Matsumoto disclose, the method as claimed in claim 2 (see above).

Matsumoto further discloses, wherein said initial sub-field is the first and second sub-fields of said frame (fig. 13 shows the order of the sub-fields, col. 25, lines 10-11 confirms that the second sub-field is indeed the sub-field that succeeds the first sub-field of the frame).

With respect to claim 4, Sakita and APA disclose, the method as claimed in claim 1 (see above).

Neither Sakita nor APA expressly disclose, wherein each of the remaining sub-fields other than the initial sub-field has a higher brightness weighting value than the initial sub-field.

Matsumoto discloses, wherein each of the remaining sub-fields other than the initial sub-field has a higher brightness weighting value than the initial sub-field (clear

from fig. 13, that the higher brightness weighting values, i.e. 2^2 , 2^5 , succeed the initial sub-field).

Sakita, APA and Matsumoto are analogous art because they are all from the same field of endeavor namely sustain electrode waveforms for plasma display devices.

At the time of the invention it would have been obvious to order and apply the different initialization waveforms of Sakita and APA to the subfields as taught by Matsumoto.

The motivation for doing so would have been decrease the number of priming pulses and enhancing the contrast without appreciable degradation in the quality of the image (Masumoto; col. 25, lines 45-47, 57-58).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
4/18/07


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